



CASE STUDY SUMMARY

The Foothill-De Anza Community College District installed a Web-enabled control and metering system.

- Participant:
Foothill-De Anza Community College District
- Building Type:
College campuses
- Size:
991,394 ft² of conditioned space
- Project Cost:
\$283,140
- Project Incentives:
\$250,750
- Primary Benefit:
\$30,000 in annual energy savings

The Foothill-De Anza Community College District used enhanced automation to save \$30,000 in annual energy costs.

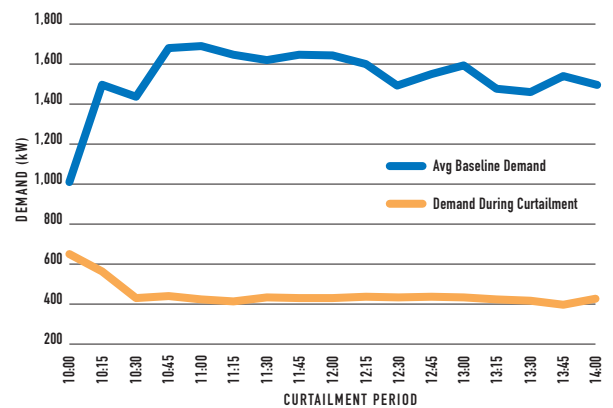
To help shield its campuses from high electricity costs and rolling blackouts, the Foothill-De Anza Community College District used funding from the California Energy Commission to install a Web-enabled control and metering system at each of two campuses. These measures not only gave the District the ability to respond effectively to energy shortages and peak prices, but also led to an estimated \$30,000 in annual energy savings.

- High energy costs
- Inability to quickly shed load
- Unpredictable energy supply

PROBLEM

Following the dramatic rise in wholesale electricity costs and the recurring threat of rolling blackouts during the early part of 2001, the Foothill-De Anza Community College District had become concerned about the region's energy supply and the possibility of high retail rates. Although the District had been making continual improvements over the years with direct digital controls and efficiency upgrades, they were not able to quickly shed enough load to avoid high demand charges. The District also lacked access to the type of energy usage data that would enable them to make informed decisions about load curtailment.

De Anza Community College Electrical Demand



The above graph shows the electrical demand (kW) on the De Anza campus during a curtailment test on July 13 between 10 am and 2 pm, compared to the campus' baseline demand (kW) for the same hours. Baseline demand was calculated using the average demand between 10 am and 2 pm on the preceding five work days, during which there was no curtailment.

- Centralized control of decentralized HVAC systems
- Ability to quickly shed load
- Access to real-time data

SOLUTION

In the spring of 2001, the District enrolled in a California Energy Commission program that funded the installation of enhanced automation equipment that enables participation in demand-responsive programs. The District learned of this funding opportunity from CMS Viron, an energy service provider that had been working with the District for several years. The District purchased and installed CMS Viron's CurtailmentVision™, a Web-enabled, integrated metering and control technology that allows for centralized, remote curtailment of loads as well as immediate access to incremental meter data. The project involved the installation of new hardware and wiring, as well as the re-programming of the existing digital energy management system (EMS).

"It's reassuring to know that we have the ability to shed load quickly, especially after seeing our electricity rates increase by 40% last summer."

"CurtailmentVision has proven to be an incredibly useful tool for troubleshooting our systems."

John Schulze
Director of Facility
Operations and Construction
Manager, Foothill-De Anza
Community Colleges



"Access to energy usage profiles allows us to verify emergency load curtailments and monitor the performance of longer-term efficiency improvements."

- **Energy cost savings**
- **More flexibility in the face of energy shortages and curtailments**
- **Less vulnerable to volatile energy markets**
- **Ability to respond to real-time pricing**

BENEFITS

The Foothill-De Anza Community College District is now able to curtail up to 1.7 MW of peak load within minutes from a single password-protected Web site. Facility operators can schedule or initiate curtailments from any computer with a standard Web browser and Internet access. This ability to shed a significant amount of peak load quickly from virtually anywhere helps reduce the likelihood of a rolling blackout within the region during an energy shortage. It also can translate into significant savings in peak demand charges.

At the same Web site, the District can also monitor instantaneous demand levels and view historical usage data, which are being collected at each campus in 15-minute increments and uploaded to the Internet. Access to such data has been useful for verifying that actual loads reflect intended use and for profiling and analyzing energy usage. Improvements in operational efficiency have saved the District \$30,000 in annual energy costs.

Because the District can quickly control numerous HVAC systems and verify the immediate effects of those curtailments on demand, they are well positioned to take advantage of demand-responsive programs that offer per kW incentives for peak load reductions. The District is also prepared for the advent of real-time pricing, as their enhanced automation enables them to respond effectively to unexpected rises in peak demand prices.



PROJECT SITE DESCRIPTION

- **Location:**
Los Altos Hills and Cupertino, California
- **Size:**
910,000 square ft² of building space
- **Space Function:**
College campuses
- **Site Contact:**
John Schulze
Director of Facility Operations and Construction Management
- **Consultant:**
CMS Viron

Energy Usage

- **Peak Demand:**
4.4 MW
- **Curtailable Demand:**
1.7 MW

Equipment Installed

- Enflex Gateway
- Enflex Controller
- Relays

Project Cost

\$283,140

Project Incentives

\$250,750

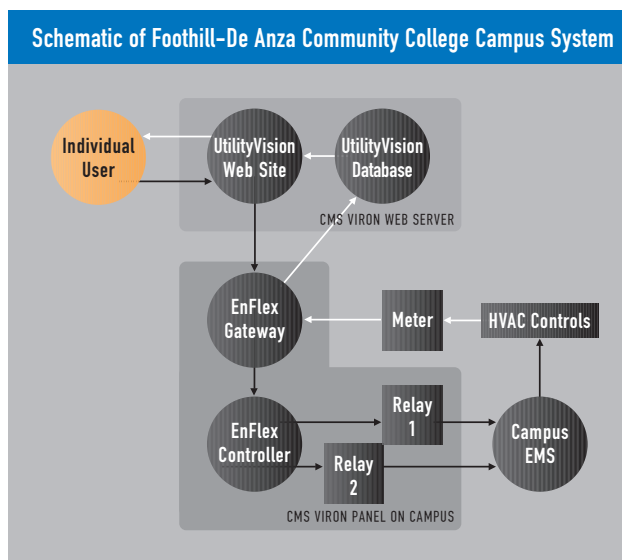
Technical Information

Foothill-De Anza Community College District's enhanced automation project involved expanding the capability of the existing Novar EMS control system and linking both the controls and utility meters to the Internet for EIS capability. To accomplish these enhancements, CMS Viron installed at each campus a panel that contains an EnFlex Internet Gateway, an EnFlex Universal Controller, and two relays.

The EnFlex Gateway connects the District's local area network to the Internet. It is through this gateway that curtailment signals are received from the Web and through which metered data from the facility is sent to the Web. The EnFlex Controller supplements the capabilities of the EnFlex Gateway. When a curtailment signal is sent from the Web, it goes through the Gateway to the Controller and to a relay. Each of the two relays corresponds to a curtailment level: one raises the temperature set points by four degrees in all the campus zones and the other shuts down the entire HVAC system.

From a password-protected Web site (www.utilityvision.com) a user can, with a few clicks of a mouse, initiate curtailments at either campus for any length of time. The curtailment commands are sent via FTP to the targeted facilities, where they are received by the EnFlex Gateway and sent to the EnFlex Controller. Depending on the command, the Controller closes either relay 1 (for curtailment level 1) or relay 2 (for curtailment level 2). When a relay closes, a digital signal is sent to the Novar EMS, which, in turn, sends digital signals to hundreds of HVAC control modules. As part of the enhanced automation project, the Novar EMS was programmed to receive and act upon signals from a closed relay.

On each campus, the EnFlex Gateway is also wired directly to a pulse initiator on the electrical meter. The pulse initiator sends 15-minute kW data from the meter in the form of digital signals to the EnFlex Gateway, which, in turn, sends the data out to the Internet and to a database located on CMS Viron's Web server. From the UtilityVision Web site, County personnel can access and view each campus' instantaneous demand as well as historical demand data.



TAKING THE NEXT STEP

Free resources are available from the California Energy Commission.

- Business Case Guidebook
- Technical Options Guidebook
- Contractor and Vendor Lists
- Technical Assistance
- Case Studies

- 1 Alameda County
HVAC Controls/
Government Facility
- 2 Hewlett-Packard
Company
HVAC and Lighting Controls/
Office Campus
- 3 Comerica Building
HVAC and Lighting Controls/
Large Office Building
- 5 Staples, Inc.
HVAC and Lighting Controls/
Retail Chain
- 6 Doubletree Hotel
Sacramento
HVAC and Lighting Controls/
Hotel and Convention Center

Contact us for free materials or for further information:

- 1-866-732-5591
- enhancedautomation@xenergy.com
- www.energy.ca.gov/enhancedautomation

Additional Resources

- California Energy Commission
www.energy.ca.gov/peakload/index.html
- Cash for Kilowatts Web site
www.energy.ca.gov/peakload/cash_kilowatts.html
(also for 50-200 kW demand)
- Your local utility
 - www.sdge.com/business/drpf.html
 - www.pge.com/003_save_energy/003b_bus/index.shtml
 - www.sce.com/sc3/002_save_energy/002i_load_redn/default.htm